Space Weather Highlights **SEC PRF 1604**
22 – 28 May 2006 **30 May 2006**

Solar activity was at very low levels. The most significant event of the period occurred at 25/2328 UTC when Region 885 (S12, L=147, class/area, Dsi/060 on 23 May) produced a B5.4 x-ray event that was accompanied by an Earth-directed, halo CME observed in LASCO imagery.
The remainder of the disk was populated by simple spot groups.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels.

The geomagnetic field generally ranged from quiet to unsettled conditions. Solar wind speed ranged from a high of about 525 km/s late on 22 May to a low of about 280 km/s late on 27 May. The Bz component of the IMF field did not vary much beyond +/- 5 nT. The geomagnetic field responded with mostly quiet conditions throughout the period.

Space Weather Outlook
31 May - 26 June 2006

Solar activity is expected to be at very low to low levels.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 04 – 06 June and again on 08 – 13 June.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. Recurrent coronal hole high speed wind streams are expected to rotate into geoeffective positions 31 May – 03 June, 07 – 09 June, and again on 14 June. Active to minor storm conditions are expected on 31 May – 03 June and 07 – 09 June while unsettled to active periods are expected on 14 June.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Optical S	1	2	3	4
22 May	83	32	100	A2.7	0	0	0	0	0	0	0	0
23 May	84	48	110	A3.4	0	0	0	0	0	0	0	0
24 May	84	44	180	A2.9	0	0	0	0	0	0	0	0
25 May	84	33	100	A3.7	0	0	0	0	0	0	0	0
26 May	82	51	200	A2.8	0	0	0	0	0	0	0	0
27 May	83	69	230	A3.5	0	0	0	0	0	0	0	0
28 May	85	78	200	A4.3	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2-day-sr) >1 MeV	>10 MeV	>100 MeV	Electron Fluence (electrons/cm^2-day-sr) >.6 MeV	>2MeV	>4 MeV
22 May	2.9E+5	1.6E+4	3.5E+3		7.1E+6	
23 May	1.3E+5	1.5E+4	3.5E+3		5.2E+6	
24 May	2.6E+5	1.6E+4	3.6E+3		6.7E+6	
25 May	2.7E+5	1.6E+4	3.6E+3		7.5E+6	
26 May	3.3E+5	1.6E+4	3.6E+3		6.5E+6	
27 May	3.7E+5	1.6E+4	3.7E+3		6.5E+6	
28 May	1.8E+5	1.7E+4	3.8E+3		3.0E+6	

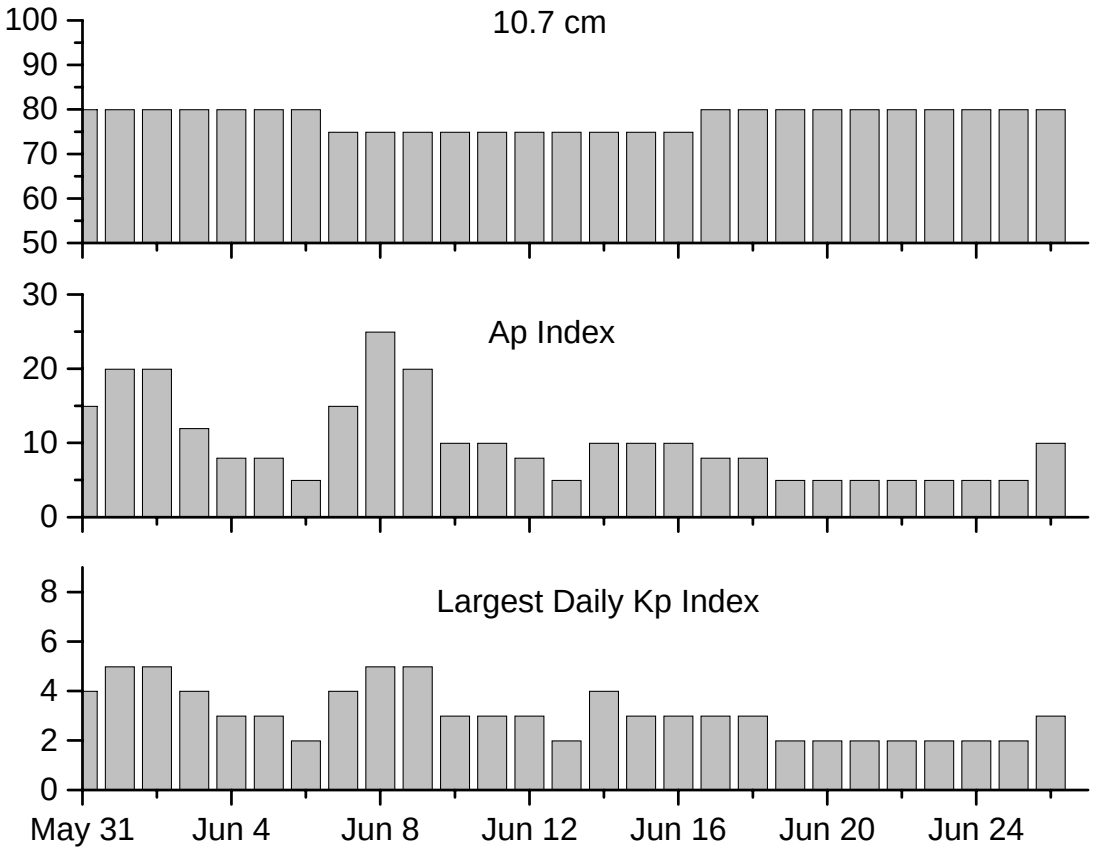
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
22 May	6	2-1-0-1-2-2-2-3	7	2-2-1-1-3-2-1-2	8	2-2-0-1-2-2-2-4
23 May	4	2-1-1-1-2-1-1-1	5	3-1-1-2-2-1-0-1	7	3-3-2-1-1-1-2-1
24 May	3	1-1-1-1-1-1-1-1	3	0-2-1-2-2-1-0-0	4	1-1-2-1-2-1-0-1
25 May	4	1-1-1-0-2-1-2-2	2	1-1-1-0-0-0-1-1	5	1-1-1-0-1-1-2-2
26 May	1	0-0-0-0-1-1-1-0	3	2-1-0-0-1-1-1-1	5	3-1-0-0-1-1-1-2
27 May	1	1-0-0-1-0-0-0-1	1	1-0-0-0-0-0-0-1	3	2-0-0-0-1-1-1-2
28 May	5	1-2-1-2-1-1-2-2	4	2-2-1-2-2-0-1-0	7	2-2-1-1-2-1-2-3

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
22 May 2217	ALERT: Type II Radio Emission	22 May 1959
26 May 0012	ALERT: Type IV Radio Emission	25 May 2315

Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
31 May	80	15	4	15 June	75	10	3
01 June	80	20	5	16	75	10	3
02	80	20	5	17	80	8	3
03	80	12	4	18	80	8	3
04	80	8	3	19	80	5	2
05	80	8	3	20	80	5	2
06	80	5	2	21	80	5	2
07	75	15	4	22	80	5	2
08	75	25	5	23	80	5	2
09	75	20	5	24	80	5	2
10	75	10	3	25	80	5	2
11	75	10	3	26	80	10	3
12	75	8	3				
13	75	5	2				
14	75	10	4				

Energetic Events

Date	Time Begin	Time Max	Time ½ Max	X-ray Class	X-ray Integ Flux	Optical Information Imp/ Brtns	Optical Information Location Lat CMD	Optical Information Rgn #	Peak Radio Flux 245	Peak Radio Flux 2695	Sweep Freq Intensity II	Sweep Freq Intensity IV
No Events Observed												

Flare List

Date	Time Begin	Time Max	Time End	Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
22 May	1937	1952	2006	B6.4			884
23 May	1333	1338	1344	B1.8			884
	1523	1528	1533	B2.2			885
	1635	1641	1646	B5.0			884
	1809	1815	1824	B1.4			
24 May	1438	1443	1446	B1.6			884
25 May	0225	0228	0231	B1.4			886
	0701	0705	0707	B2.4			885
	1227	1231	1233	B1.7			885
	1817	1905	1927	B1.4			
	2303	2328	2343	B5.4			885
26 May	No Flares Observed						
27 May	0720	0723	0725	B1.0			888
	1420	1431	1438	B2.9			885
	1634	1643	1647	B7.3			885
28 May	1252	1257	1303	B1.6			890

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 884										
19 May	S13E47	156	0020	05	Bxo	005	B								
20 May	S13E33	157	0090	06	Cso	007	B								
21 May	S14E22	154	0050	07	Cso	005	B								
22 May	S13E08	155	0040	07	Cso	006	B								
23 May	S13W05	155	0020	05	Dso	004	B								
24 May	S12W14	150	0040	03	Cso	003	B								
25 May	S12W31	151													
26 May	S12W41	151													
27 May	S12W54	151													
28 May	S12W67	151													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 155

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 885										
20 May	S12E44	146	0040	04	Cro	002	B								
21 May	S12E32	144	0060	06	Dro	005	B								
22 May	S12E17	146	0060	07	Dso	006	B								
23 May	S12E03	147	0060	06	Dsi	011	B								
24 May	S12W09	145	0060	02	Dso	004	B								
25 May	S11W25	148	0050	09	Dso	008	B								
26 May	S12W38	148	0040	07	Cro	003	B								
27 May	S12W54	151	0020	02	Cro	003	B								
28 May	S12W67	151													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 147

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					R*egion 886*										
23 May	N08E46	104	0030	05	Cro	003	B								
24 May	N07E31	105	0080	07	Dso	007	B								
25 May	N08E16	107	0050	06	Cao	005	B								
26 May	N08E04	106	0060	08	Cso	003	B								
27 May	N08W12	109	0050	07	Cso	006	B								
28 May	N07W24	108	0030	04	Cso	005	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 106

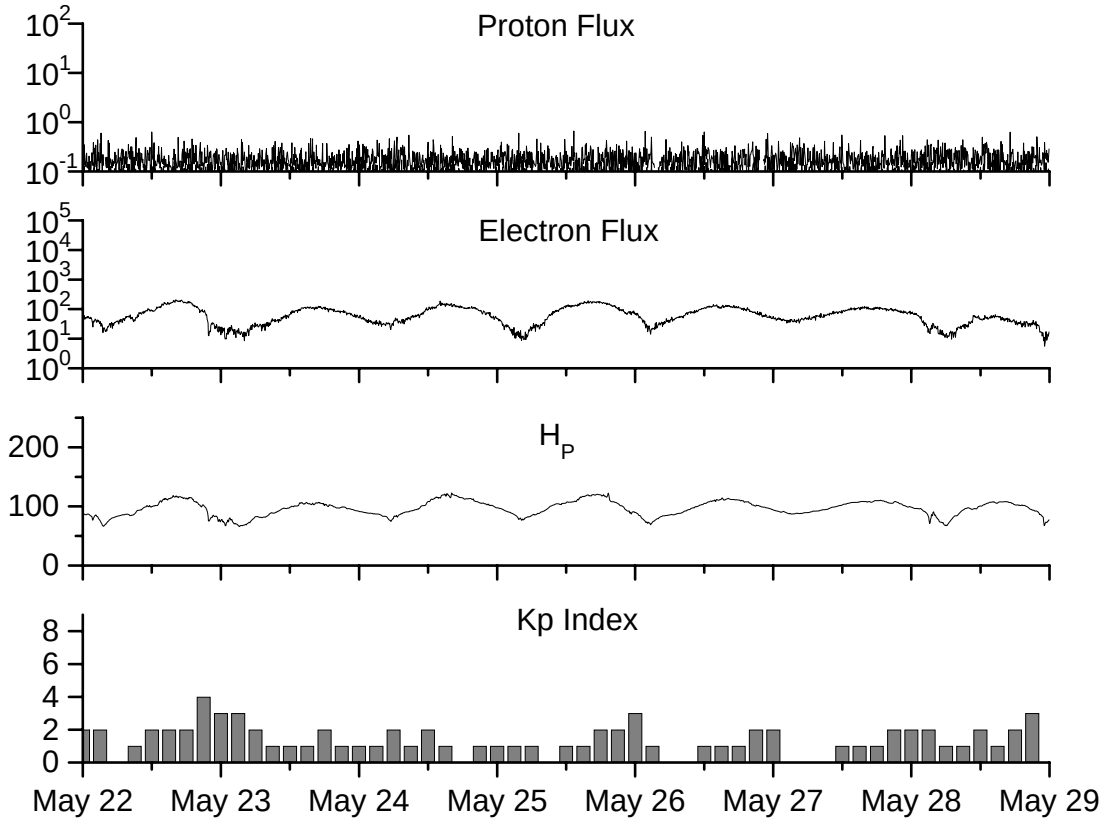
Region Summary-Continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 887										
26 May	S12E64	046	0030	06	Bxo	002	B								
27 May	S13E52	045	0050	06	Cro	004	B								
28 May	S12E38	046	0030	05	Cao	005	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 046															
					Region 888										
26 May	N05W64	174	0070	06	Cso	003	B								
27 May	N06W77	174	0090	06	Dao	004	B								
28 May	N05W91	175	0060	06	Cao	002	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 174															
					Region 889										
27 May	S03E12	090	0020	04	Cro	002	B								
28 May	S02W06	090	0040	02	Cso	006	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 090															
					Region 890										
28 May	S14W29	113	0040	05	Cso	010	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 113															

Recent Solar Indices (preliminary) of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2004					
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
				2005					
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	42.9	25.9	96.6	87.8	16	11.8
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	
				2006					
January	28.0	15.4	0.55			83.8		6	
February	5.3	4.7	0.89			76.6		6	
March	21.3	10.8	0.51			75.5		8	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 22 May 2006

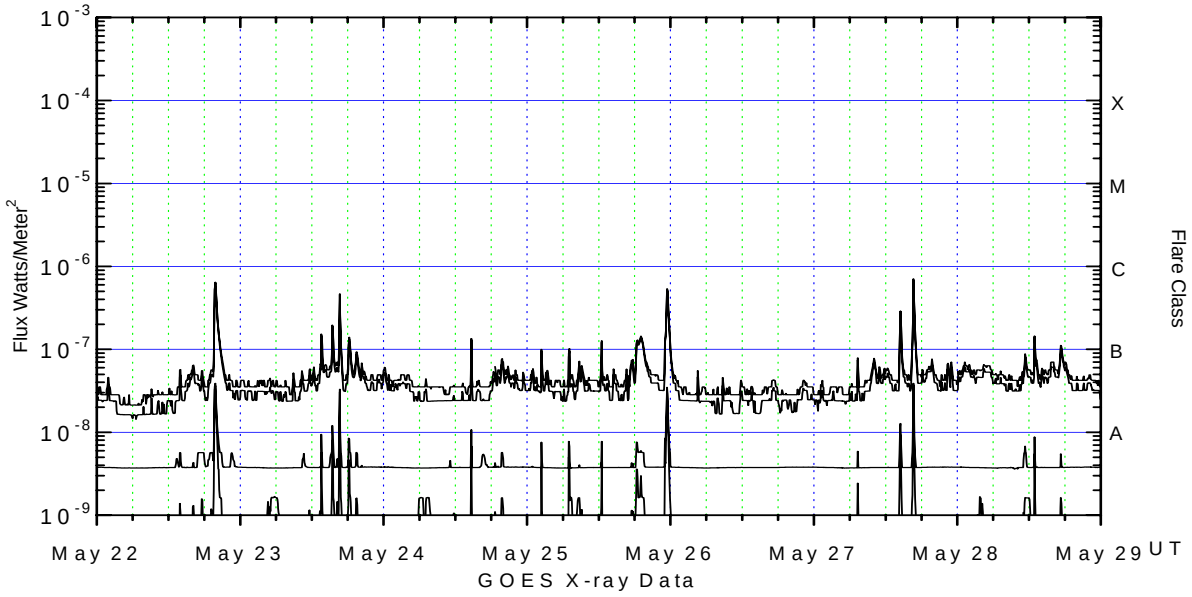
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec –sr) as measured by GOES-11 (W101) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

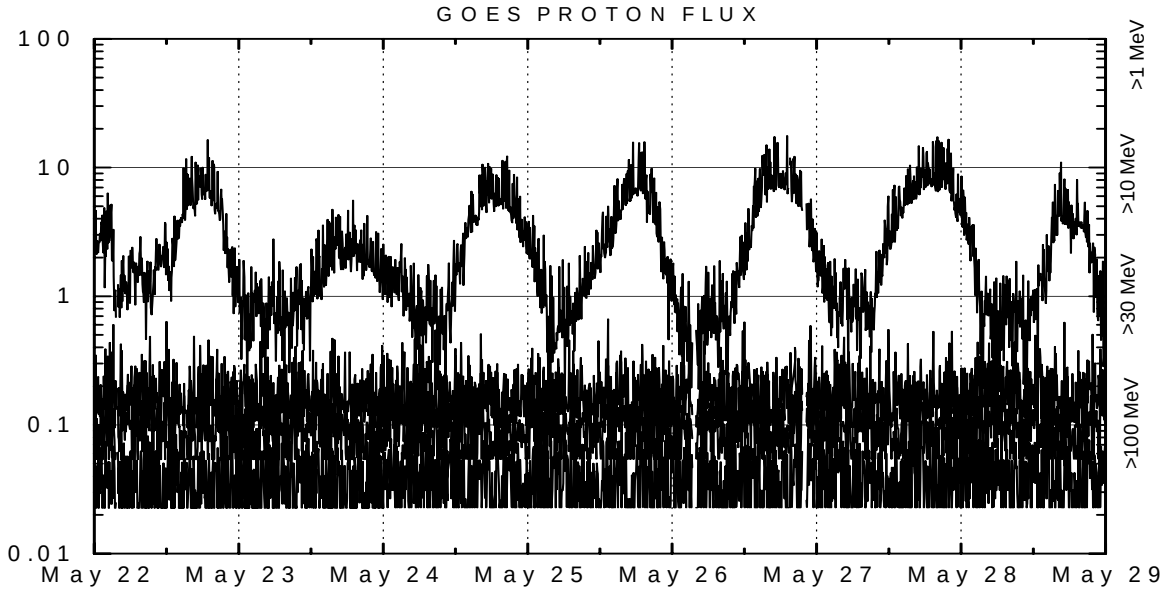
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-12 (W75).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SEC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are "global" parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m$^{2)}$ as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 -. 4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

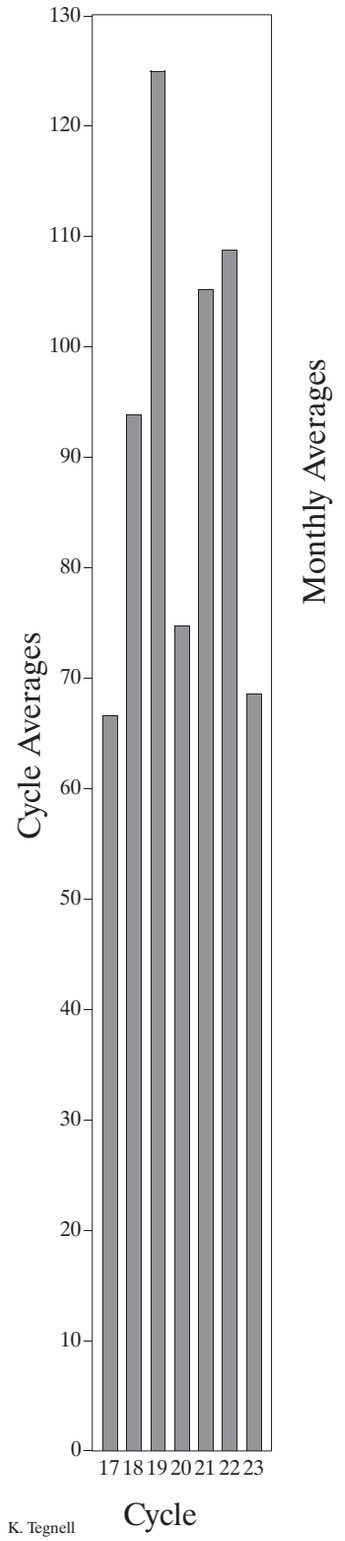
Proton plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec-sr) as measured by GOES-11 (W114) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.

Sunspot Number (RI)

March 2006
(Month 114)

Preliminary data

Space Environment Center



K. Tegnell